CUSTOMISING A SPACE MARINE PREDATOR

In this tutorial we're going to be working on the excellent Space Marine Predator Tank kit from Games Workshop.

The humble predator is one of the most flexible model kits Games Workshop produce, and with some reasonably simple modification work it can be made into a practical choice for a wide variety of situations without having to purchase a new kit for each variant. When using expensive after-market parts as we are here, this can be a boon.

Some of the steps presented in this tutorial require specialised tools - without these the conversion work would be difficult, if not impossible. Most reputable hobby shops should stock most things that are needed.

Rare-earth magnets are also used in this tutorial. Care should be taken with these and sensitive items, such as pacemakers, credit cards and so forth, even though the size we're using should be pretty safe.

First, let's look at what's needed for the modelling work:

You Will Need

1) Hobby knives, clippers, needle files, 300 & 600 grit emery paper.

2) Old paintbrush, sculpting tool, toothbrush, razor saw, surfacing putty (I use Vallejo Plastic Putty), green stuff.

3) Pin vice with 1mm bit, 2.5mm bit, 4.5mm bit, cocktail sticks, liquid polystyrene cement, superglue, permanent marker.

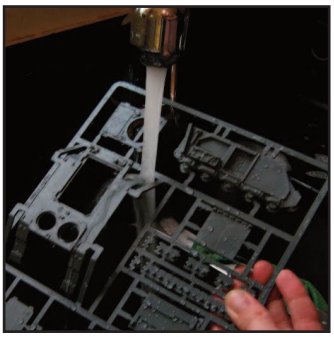
In addition you will need some 3mm diameter x 1mm rare-earth magnets.

This is the second tutorial I've written as a full article. Rather than painting, this article is focussed on modelling - both in showing an effective magnetising method and how to handle resin parts. I hope it's found interesting and useful.

Cheers,
Winterdyne.

1 Washing Parts

Wash: *Sprues can be greasy. Wash with soapy water.*



Rinse: *Soap residue can be just as bad as grease. Rinse well.*

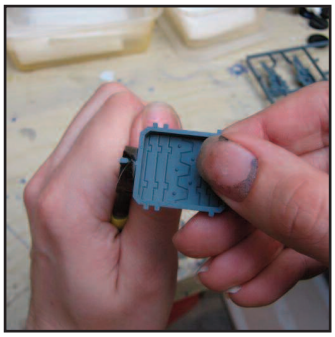
Resin: *Resin parts should also be scrubbed. An all-purpose cleaner works well.*

Plastic models are cast in steel moulds, which are frequently greased to prevent the set plastic from getting stuck to them. It is good practice to clean the parts before assembly.
A bowl of slighltly warm water with washing up liquid added to it is ideal for cleaning up.
It is important when done to rinse the parts thoroughly as the soap can also leave a residue which is unwanted. Once thoroughly rinsed, allow the parts to dry, or use a hairdryer on cold.

Resin parts are generally cast in silicone rubber moulds, which must be treated to allow the parts to be removed. Depending on the manufacturer the release agent can range from a dusting of talc on the mould to vaseline style oils. In any case, this agent must be removed to allow paint and adhesives to work correctly. I find that a weak solution of all purpose multi-surface cleaner works very well, again scrubbing with a toothbrush to ensure the parts are properly cleaned and rinsing and drying throughly.

2 Cleaning up Plastic Parts

First Clip: *Cut away the part from the sprue. Leave a small amount of sprue attached.*



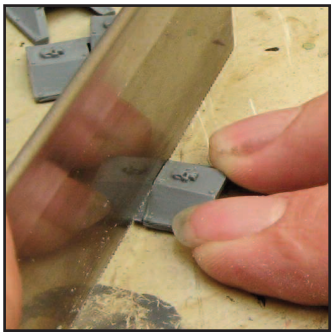
Second Clip: *Now make another clip closer to the part. This helps avoid damaging mistakes.*

File: *The leftover nub on the part can be filed away using a needle file.*

It's very easy to damage model parts when removing them from the sprue. Taking your time in preparing the parts will leave you with a better result and an easier time in assembly. Many modellers use a 3-step method - first making 'rough cuts' using side-cutters before removing more and more sprue with subsequent cuts. Any remaining nubs or flash lines can be filed using a needle file as shown above. Flash lines can be removed easily from smaller parts by simply scraping with a knife.

Scraping Flash: *A hobby knife can be used to remove flash from small parts.*

3 Cleaning up Resin Parts



Saw rather than clip:
Resin can be brittle. Use a razor saw to remove excess material and avoid using clippers if possible.

Polyurethane resin can be brittle, depending on how much hardener was in the mix. Forgeworld have notoriously inconsistent mixes with their resin and as such, some care must be taken.

Using a razor saw rather than clippers to remove excess casting channels (and certainly for large blocks) is good practice. Be aware that the sawdust is not good stuff to get in your eyes or lungs - suitable protective gear is recommended. Remember that it's the movement of the saw that cuts - don't be tempted to apply too much pressure with it.

File down and sand:
Further excess material can be removed using a needle file and some 600 grit emery paper.

Generally a dremel or similar power tool will simply melt the resin rather than achieve a clean cut, so these are often best avoided.

Once the bulk of the excess has been removed by using the saw, a combination of filing and sanding is the best way to remove any trace of the excess and to tidy up the surfaces.

Thin superglue can be used to fill small air bubbles. Large ones can be filled with putty. In either case, once fully cured, the filler material can be sanded down now.

4 Magnetising the Sponsons

Magnetising the weapons is a fairly involved task. We are aiming to have no visible changes to the model once it is assembled so much of the work will never be seen, and to have complete interchangeability of weapons.

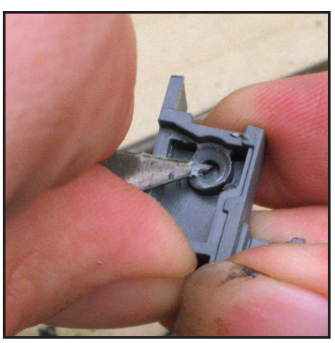
The heavy bolters and lascannons are both modified in exactly the same way:

We start by boring larger holes into the mounts for the axle and then removing the 'walls' of the mounts to give room for the mounting post to be inserted and removed.

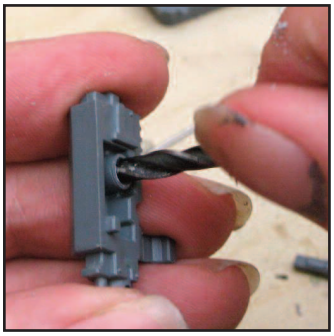
On the inner side, we simply carve away the column that would hold the axle. On the outer side, we will mount a magnet. There will be a matching magnet on the actual mounting post.

The mounting post itself has the horizontal axle removed, and is modified to hold a rare earth magnet that corresponds to the ones mounted in the weapons.

Step 1 - Bore out pivot:
Use a 4.5mm bit to bore out the hole where the pivot axle would go.



Step 2 - Carve flush:
With a sharp knife, carve away the outside of the pivot mount, so that it's flush with the slot at the top of the weapon.

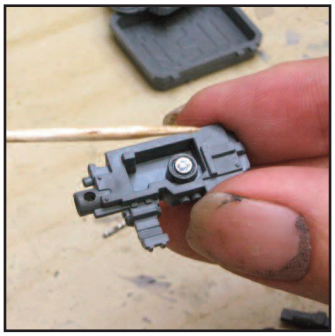


Step 3 - Bore out outer pivot:
Again, use a 4.5mm bit to bore out the hole where the pivot axle would go.Try to keep the hole centered.

Step 4 - Apply superglue:
Use a cocktail stick or similar method to apply a small amount of superglue to the bored out hole.

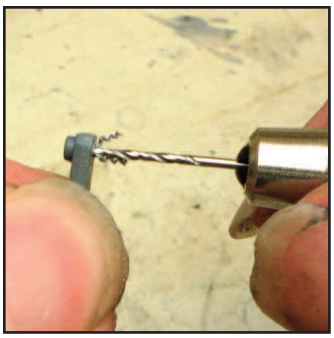
Step 5 - Insert magnet:
A cut-off paperclip makes a good handle to hold magnets as you glue them. Make sure the magnet sits flat in the hole.

Step 6 - Seal in magnet:
Apply a smear of superglue over the top surface of the magnet and into the gap around it to hold it in place. This magnet must stay stuck!



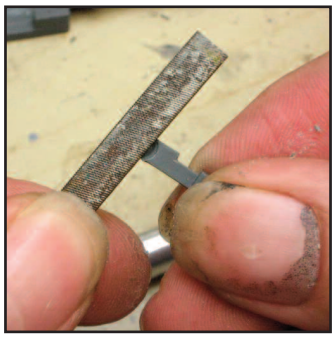
Step 7 - Trim axle:
First we remove the axle from the outer side of the mounting post. Ensure everything is removed so the post is flat and smooth.

Step 8 - Mark centrepoint:
Precision is now important, so we carefully mark the exact centre of where the axle was, on the inside.



Step 9 - Pilot hole:
Very carefully, we drill a pilot hole to a depth of about half the thickness of the post. To retain strength, it is important not to drill right through.

Step 10 - Bore out:
Using a 4.5mm bit, we bore out the pilot hole. The larger hole will be wider than the post, so take care to keep it centred.

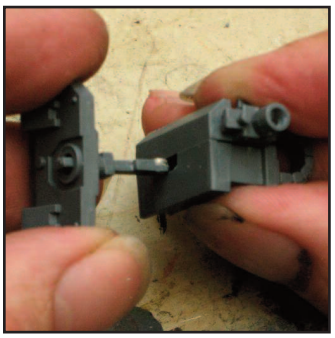


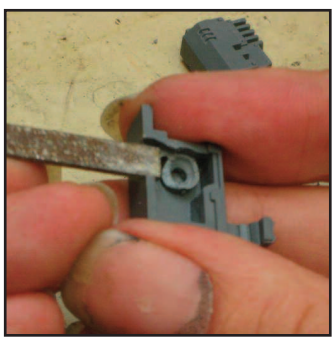
Step 11 - File flat: *Filing across the hole with a flat file, smooth the hole out so there is a 1mm clearance so the magnet can be fitted flush with the post.*

Step 12 - Attach magnet: *Superglue a 3x1mm magnet onto the post. Ensure that it sits flush with the post as shown and that its polarity matches the ones in the weapons.*

It's important to keep checking the fit of the parts before gluing them together.
Once the magnets are installed, make sure the guns can slide on and off the mounting post with very little or no resistance apart from the magnet.
Parts that rub a little with no paint on, will rub more once painted, and this can either damage the finish, or worse make the painted parts not fit properly.

Step 13(a) - Dry Fit: *Hold the gun halves together and check the mounting post can be easily inserted and removed.*





Step 13(b) - File down: *If the mounting post gets caught on the slot or on the bored-out parts of the guns, further filing down is needed.*

You may need to enlarge the slot in the top of the weapons to allow the mounting post to be inserted, or you may need to file down the insides of the gun where the axle would have gone to allow the gun to sit square on the magnet.
Once you are happy with the final fit, the weapons can be glued together and the seams cleaned up.
We're now done with the magnetising for the sponsons. Next we'll tackle the main gun and turret.

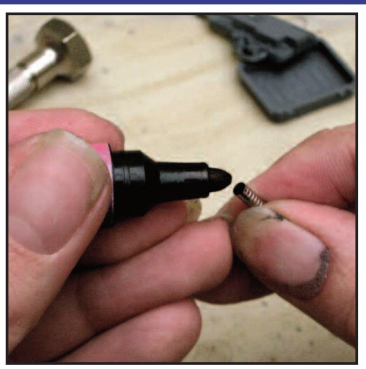
Top Tip

Marking Magnets

When using magnets, the polarity (facing) of the paired magnets is important. If magnets are glued to parts in the incorrect way, the magnets will repel each other rather than attract.

As they come, there is no easy way to tell which side is which on a magnet. A permanent marker is a quick, convenient way of marking one side of the magnets.

Every time you take a magnet from the stack, mark the top of the stack with the marker. You then know that the marked side of a magnet should face the unmarked side of its counterpart.

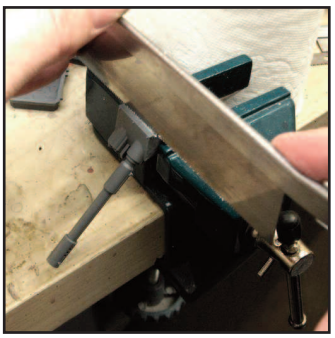


Mark It! *Use a permanent marker to identify which side is which on a stack of magnets.*

5 Magnetising the Main Guns & Turret

Magnetising the main guns can be tricky, and it's worth taking your time to read through and understand the following steps before you start.
We begin by gluing the main guns together and allowing them to set thoroughly. A clothes peg or similar clamp can be used to hold them. If using a crocodile clip (a metal clip with teeth) it's a good idea to protect the plastic part with a little card to prevent it being marked.
Once the guns are fully set, we remove the large round axle behind the gun by making two cuts, parallel to the armour plate. Both guns yield an identical axle, of which we only need one, so there are two chances to get this right. Take one of the axles we've cut free, and remove the triangular lugs from it. File the resultant surface flat. This will be the mount for both weapons. Spot a hole in the centre of the mount and bore it out with a 4.5mm bit to accept a magnet.

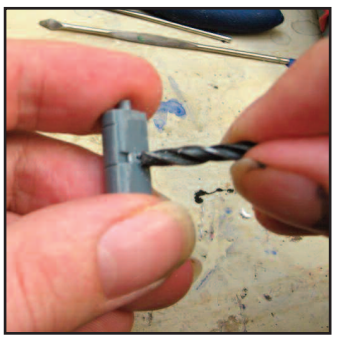
Step 1 - Glue Main Guns:
Glue the main guns together and allow them to set fully.



Step 2 - Cut Free:
With a razor saw, cut the weapon free of the axle, working parallel to the armour plate.

Step 3 - Remove Lugs:
With a pair of clippers, remove the triangular lugs from the weapon mount.

Step 4 - File Flat:
Using a flat file, ensure the mounting surface is smooth.



Step 5 - Drill Hole for Magnet:
A 4.5mm bit is used to bore out a hole to accept a 3x1mm magnet.

Now assemble the two halves of the turret. The axle with its magnet should not be glued, but should have a reasonaby tight fit to support the weight of the weapons. If it feels loose, puttting some PVA glue around the pegs will tighten it up. The PVA should not bond the plastic, but will ensure a tighter fit. Do not glue the turret halves together until the fit for the weapon mount is tight enough.

Step 6 - Assemble:
With the magnet installed assemble the turret. You want the fit of the axle in the turret to be fairly tight.

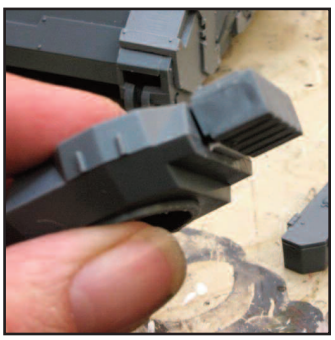
We now turn our attention to the ammunition hoppers. A magnet is installed in the centre of the back of the turret, between the two lugs that position the hopper. I've added a brace underneath made of plasticard, but this could just as easily have been made from a piece of matchstick - its only purpose is to hold the hopper square whilst it's attached.
Next we prepare two strips of plasticard which will hold the magnet for each of the main guns. This is cut so it's just slightly smaller than the width of the gun assembly, and is held in place on a bed of green stuff. The putty is smoothed over the sides of the gun assembly to hide the join from the sides. When smoothing it's a good idea to allow the putty to cure partly, and trim away excess with a razor blade before using a moistened finger tip to smooth it out. When the sides are smoothed out, put the guns aside to allow the putty to cure fully before installing the magnets.

Step 7 - Magnetise Back of Turret:
Mark and drill a hole for a magnet on the back of the turret. Bore out witha 4.5mm bit and install a magnet.

Step 8 - Install Brace:
A small strip of plasticard is glued under the magnet. This holds the ammunition piece away slightly and keeps it square.

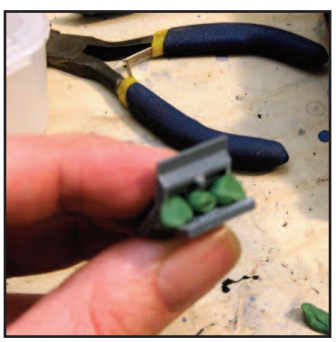
Step 9 - Magnetise Ammunition:
Assemble the ammunition hoppers exactly as per the kit instructions and install a magnet to pair with the one in the turret.

Step 10 - Test Fit:
Check that the ammunition hoppers sit square when viewd from above or behind - errors there are much more noticeable than from the side..



Step 11 - Prepare Shim:
Cut two strips of plasticard and fit one it into the back of each of the main guns. File it down slightly so it's just a little narrower than the gun assembly.

Step 12- Putty:
Put the plastic shim aside for a moment and put a few small blobs of putty onto the back of each of the main guns.



Step 13 - Drill Hole for Magnet:
Drill a hole in the centre of the plastic shim to accept a magnet. Don't install the magnet just yet.

Step 14 - Fit Shims:
Press the drilled plastic shims onto the putty we prepared earlier. Smooth the putty over the sides of the shims to hide the join.When the putty has cured we can .install the magnets.

Top Tip

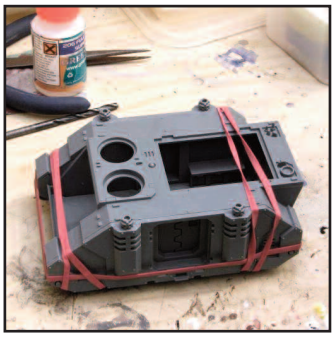
Papering Over Magnets

Sometimes magnets can be pulled free - either they are knocked loose or the strength of the magnetic pairing is just stronger than that of the glue holding one or both of them in place.
The simple trick of gluing a piece of paper over one of the magnets can help prevent magnets being pulled out by both providing another restraint and keeping the magnets from actually touching.

Covered: *Supergluing a strip of paper to cover the magnet can help prevent it being pulled free.*

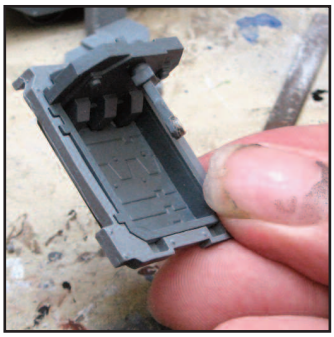
6 Attaching the Forgeworld Parts

We now come to using the Forgeworld parts we cleaned up earlier. First all the plastic parts of the hull should be assembled, including the roof. Starting with the reinforced door frames, we carefully file and shave the inside so that the plastic sponson lining fits snugly inside it as shown in step 3.
It may be the case that there is fairly major shrinkage of the part as shown in step 4a - if this happens there really is little that can be done - if forced, the part will probably snap as shown in step 4b. We'll fix it next.



Step 1 - Assemble Hull: *Assemble the plastic portion of the hull and allow to set fully.*

Step 2 - Prepare Frames: *With a hobby knife and flat file, carefully adjust the inside of the frame so that the sponson will fit into it.*



Step 3 - Dry Fit: *Dry fit the sponson lining onto the resin frame. If it fits well, superglue it in now.*

Step 4(a) - Prepare for the Worst: *This part has shrunk badly. The best way to fit it is to make a number of controlled cuts. Forcing it...*

Step 4(b) - Oh, Snap!: *... will snap the part, probably in an awkward place like this. The correct method is to to cut the part in easy to fix places.*

So we have a broken frame. First, don't panic! Then, isolate the broken parts, and make a couple of cuts to allow us to extend the frame so it fits around the plastic sponson. Here I've cut the vertical struts as they were nice and smooth.

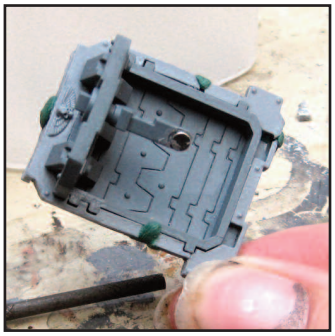
Clean these parts up of any messy burrs or splintering bits of resin, and superglue them to the sponson. It'll become very apparent through the gaps between the pieces how much the resin part has shrunk.

Now we break out the green stuff and start filling the gaps. It's easier to get sharper edges with greenstuff once it's begun to harden, so apply a few blobs and leave it for a bit, or use more hardener (blue) in your mix.

Once the green stuff's gone off a bit, use a wet fingertip and flat sculpting tool to smooth it out as much as possible. Don't attempt to get it perfectly level - leave it bulging a bit, it's easier to sand and file it down completely flat once its fully cured.

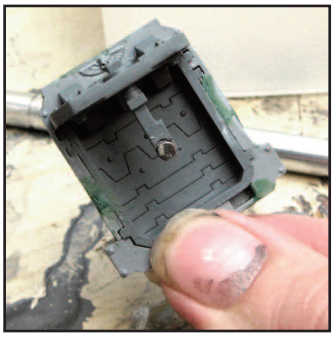
Step 5 - Isolate breaks, make neater cuts: *Making cuts that are easy to fix allows us to extend the shrunken frame to fit the sponson properly.*

Step 6 - Glue to sponson: *Glue the individual pieces to the sponson frame. This will leave gaps that we can fill easily enough, and ensure it all fits.*



Step 7 - Apply Putty: *Put a few blobs of greenstuff into and around the gaps, and on any rough areas to smooth it out. To get harder edges, allow it to set a little bit.*

Step 8 - Smooth it: *Before the putty sets fully, smooth it out to minimise the amount of filing and sanding that needs to be done to it.*

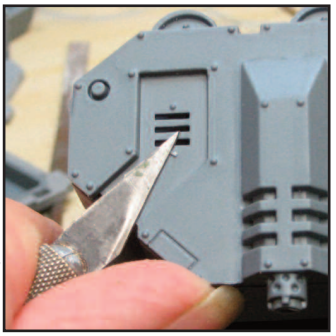


After finishing off the frame, filing any rough green stuff work smooth, the assembly can be glued to the hull, dry fitting and filing first if required.

We next work on the reinforced armour panels. These are really very simple, and providing you keep a tub of hot water nearby and remember to shave off the rivets on the hull that go under the plates, they should fit very easily.

Fit the main plates before the exhaust covers. The exhaust covers have lugs that fit into the recesses on the exhausts (they don't 'slide'), so choose a position for them that you like.

Step 9 - Fit Armour: *This is really easy - remember that you can bend the armour slightly after warming it in hot water for 30 seconds. The only real trick is to remember to shave the rivets off the hull where it goes.*



Once the armour is fitted, the work with the forgeworld components is finished.

The next stage of work is simply finishing off the kit, and adding any other accessories, and preparing the model for painting.

7 Final Assembly and Preparation for Painting

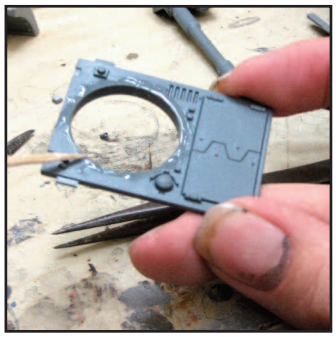
We now finish of the kit, for the most part following the instructions.

As we are not going to be painting the interior, we're going to cover the only hole that can really be seen through - the turret hole. A neat covering of paper is preferable to seeing a messy interior.

Now is the time to start planning how the tank should look - any 'hard' battle damage, that is to say anything which requires actual modelling - not just paint chipping should be done now.

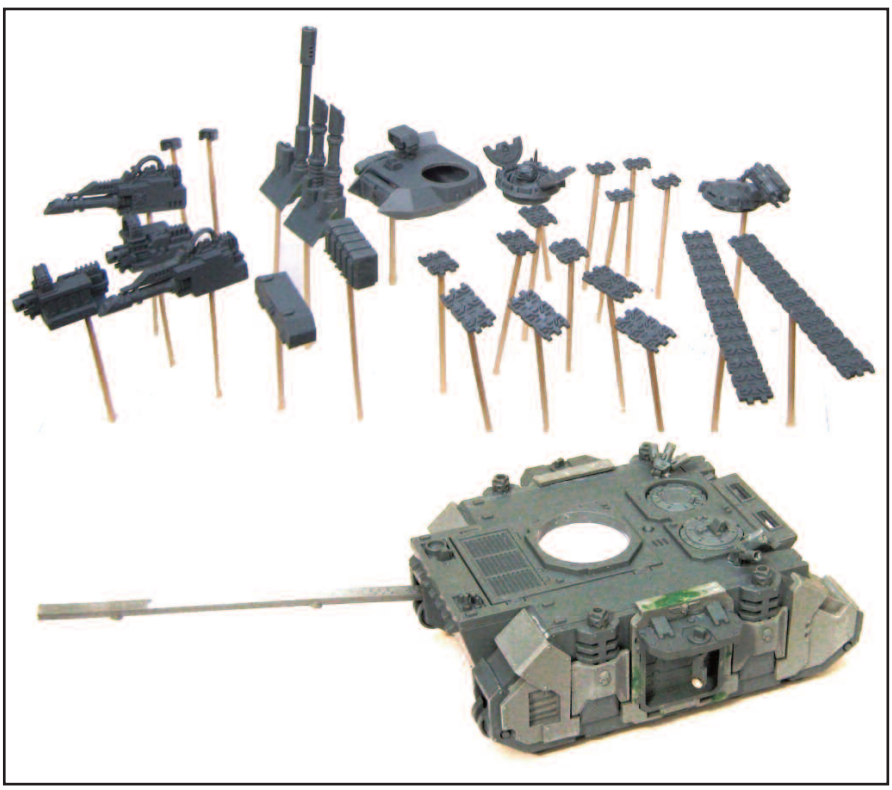
Further detailing is also added at this stage - I used various accessories from the Tamiya 1/48 Jerry Cans set, specifically the bedrolls, as well as an old MKI Rhino box.

When adding accessories, remember to take the time to ensure that it looks 'right' with the different options (weapons, ammunition hoppers) that you've gone to the effort of magnetising.



Covering the Turret Hole (1): *With a cocktail stick, run a bead of superglue around the inside edge of the turret hole.*

Covering the Turret Hole (2): *Press a square of paper down onto the bead of superglue. This neatly covers the hole.*



All Ready to Paint: *Small parts glued to cocktail sticks, and the hull to a length of sprue.*

To help with painting, I am a follower of the 'painting stick' method.

For most of the small components, I take a cocktail stick, cut off one of the points, file it smooth and superglue the component to it. Use only a very small amount of glue - the bond isn't supposed to be permanent.

The hull itself wouldn't be held by a cocktail stick, so I superglue a straight length of offcut sprue into the track assembly - it's actually glued to the underside of the door 'passage' and wedged between the pegs holding the track section halves together.

We're now all set to prime the model and that concludes this tutorial. I hope you've enjoyed reading it, and found it useful.